

# Comparison UUnifast and DRS

Souvik Sarkar and Mario Günzel

December 18, 2022

## **Abstract:**

This is a short comparison of the evaluation results obtained from UUnifast and from DRS.

## **UUniFast:**

For UUniFast suspension time `['sslength']` is drawn uniformly from the interval between the minimum suspension length value and maximum suspension length value. We have the following three setups:

- Setup 1 Short Suspension  $[0.0(T_i - C_i), 0.2(T_i - C_i)]$
- Setup 2 Moderate Suspension  $[0.2(T_i - C_i), 0.4(T_i - C_i)]$
- Setup 3 Long Suspension  $[0.4(T_i - C_i), 0.6(T_i - C_i)]$

## **DRS:**

Unlike UUniFast, Dirichlet- Rescaling Algorithm are used for asymmetric constraints and works with separate upper bounds and lower bounds for each task.

The three different setups for DRS used here:

- Setup 1 ( $\text{minsus} + \text{ex} = 0.1 * \text{number of tasks per set}$ ,  $\text{maxsus} + \text{ex} = 1.0$ )
- Setup 2 ( $\text{minsus} + \text{ex} = 0.3 * \text{number of tasks per set}$ ,  $\text{maxsus} + \text{ex} = 1.0$ )
- Setup 3 ( $\text{minsus} + \text{ex} = 0.5 * \text{number of tasks per set}$ ,  $\text{maxsus} + \text{ex} = 1.0$ )

Here, we are taking three different setups each with different execution + suspension time but same execution time.

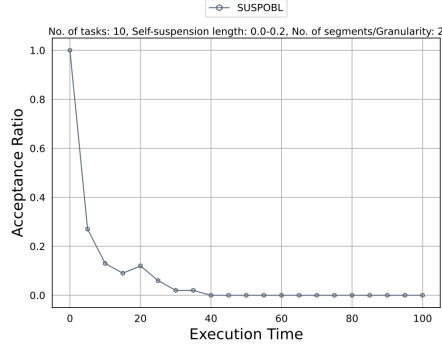
## **Setup:**

All the scheduling algorithms are bench marked using test sets which are created using UUniFast and DRS. The task sets generated using DRS or UUniFast had different parameters in place but few selected parameters were kept constant for all the scheduling algorithms whereas other parameters varied based on the task set. Parameters such as Execution time, Suspension time, Suspension length and other changed depending on the setup used but parameters like Tasks per set and Task sets per configuration remained constant at 10 and 100 respectively for all the setups used.

# 1 Suspension Oblivious

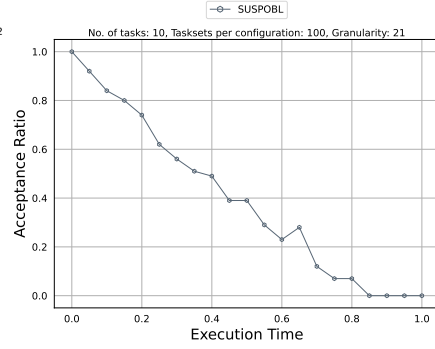
We are going to generate a suspension-oblivious schedule for the DRS and UU-niFast setups explained above

(UUnifast)

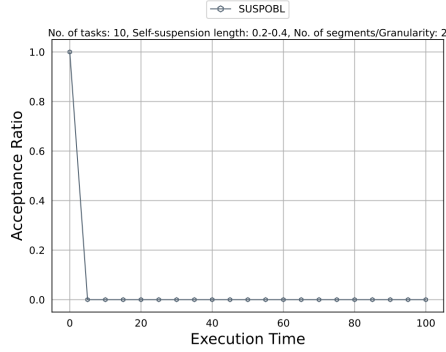


First UUnifast setup.

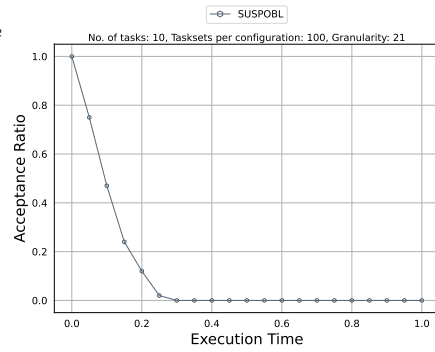
(DRS)



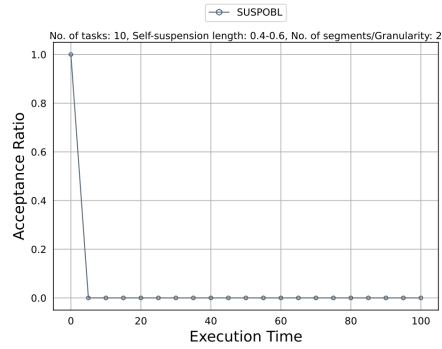
First DRS setup.



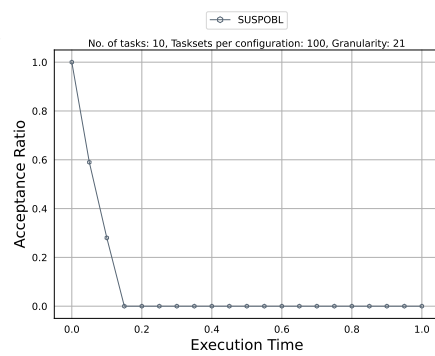
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

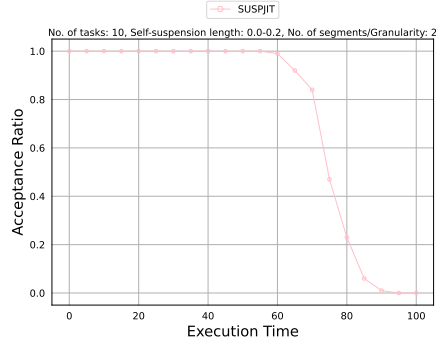


Third DRS setup.

## 2 Suspension Jitter

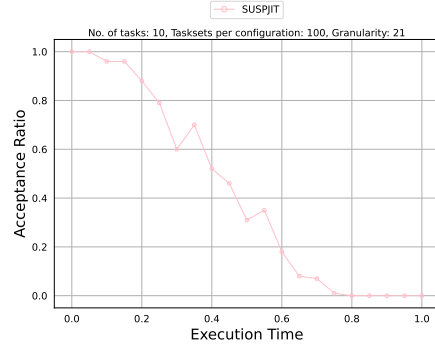
We are going to generate a suspension-jitter schedule for the DRS and UUniFast setups explained above

(UUniFast)

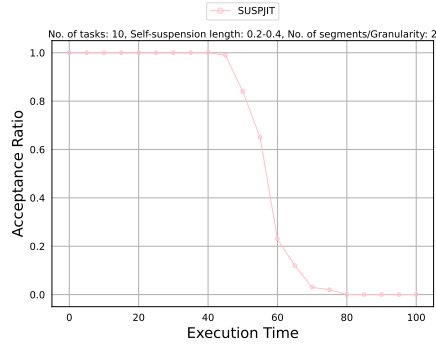


First UUniFast setup.

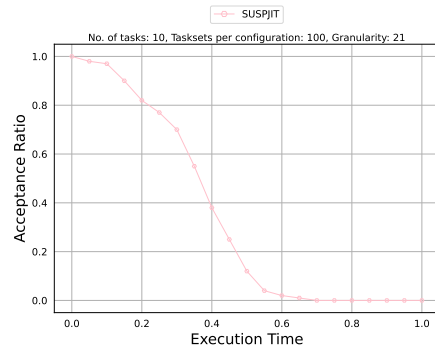
(DRS)



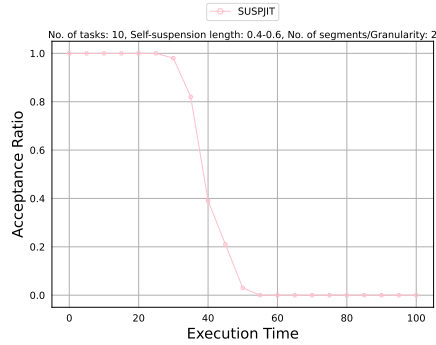
First DRS setup.



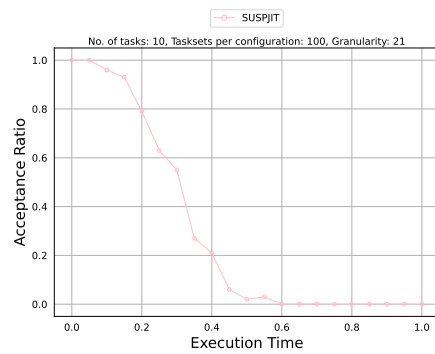
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

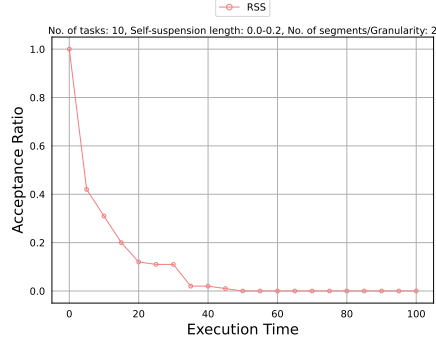


Third DRS setup.

### 3 RSS

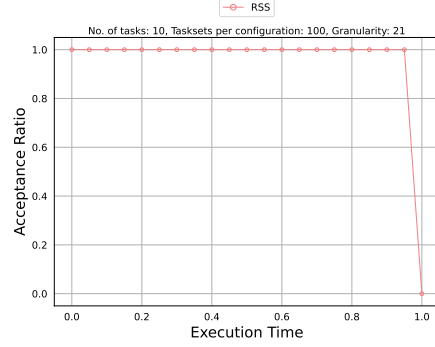
We are going to generate a RSS schedule for the DRS and UUniFast setups explained above

(UUniFast)

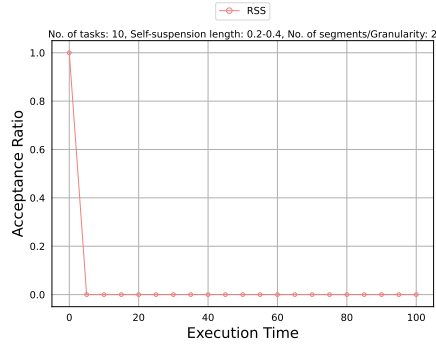


First UUniFast setup.

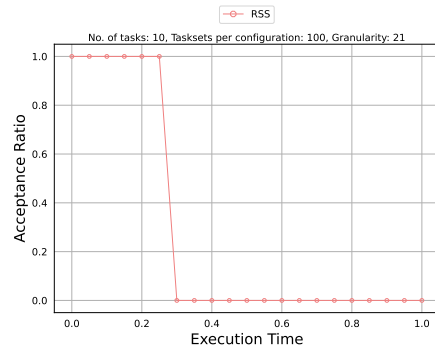
(DRS)



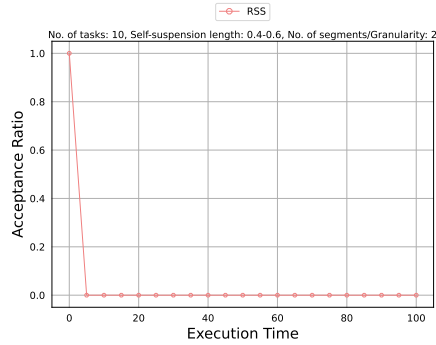
First DRS setup.



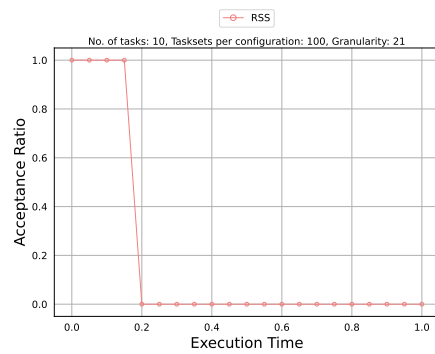
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

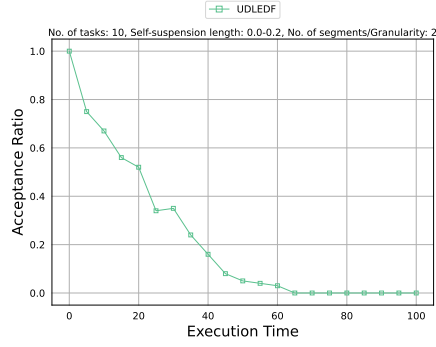


Third DRS setup.

## 4 UDLEDf

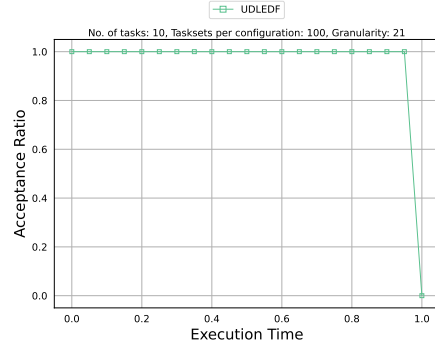
We are going to generate a UDLEDf schedule for the DRS and UUniFast setups explained above

(UUniFast)

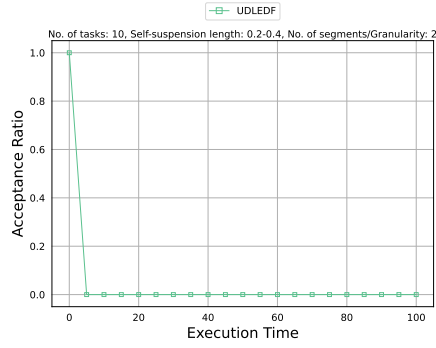


First UUniFast setup.

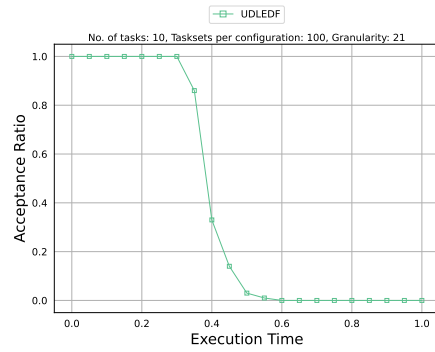
(DRS)



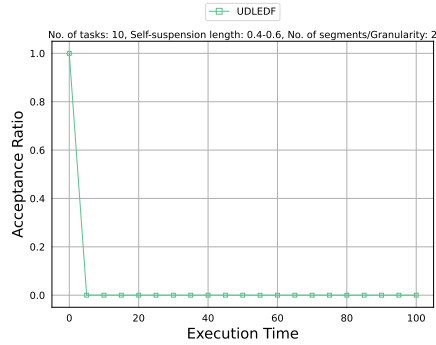
First DRS setup.



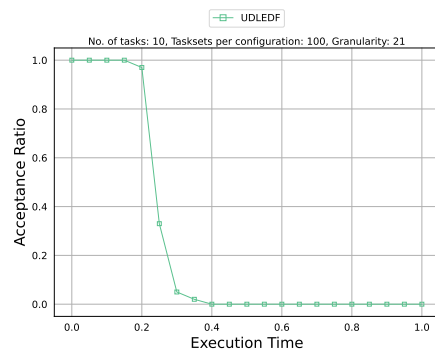
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

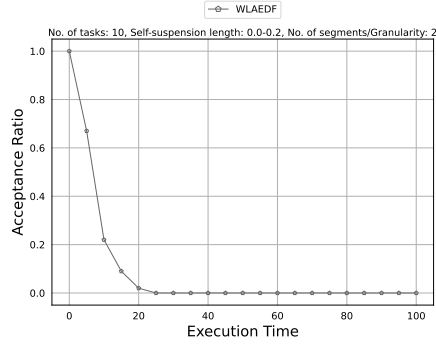


Third DRS setup.

## 5 WLAEDF

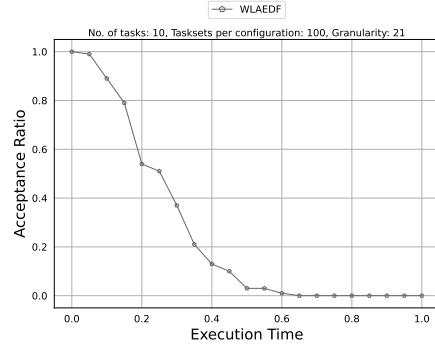
We are going to generate a WLAEDF schedule for the DRS and UUniFast setups explained above

(UUniFast)

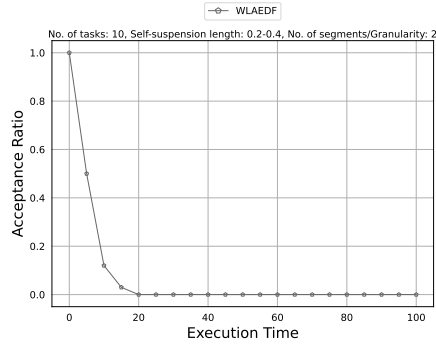


First UUniFast setup.

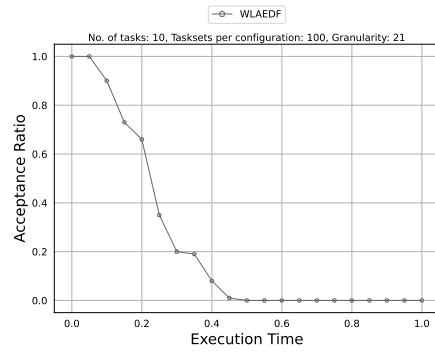
(DRS)



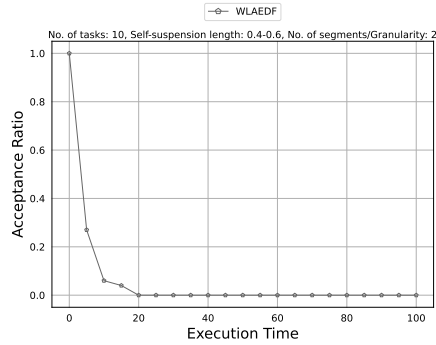
First DRS setup.



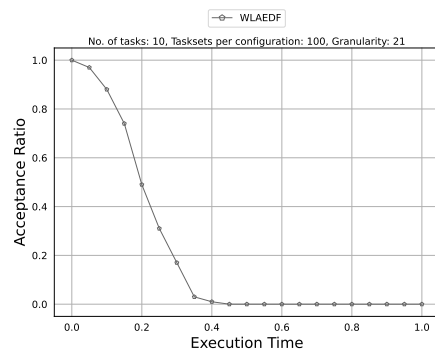
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

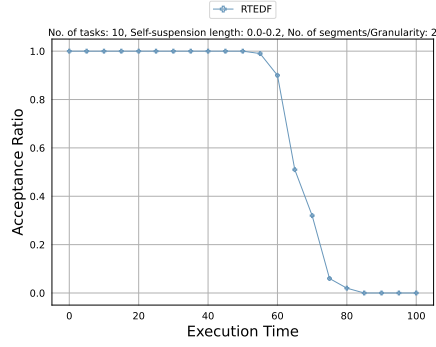


Third DRS setup.

## 6 RTEDF

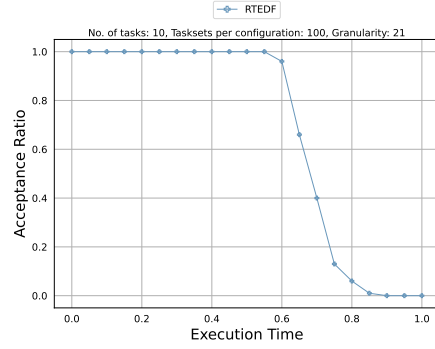
We are going to generate a RTEDF schedule for the DRS and UUniFast setups explained above

(UUniFast)

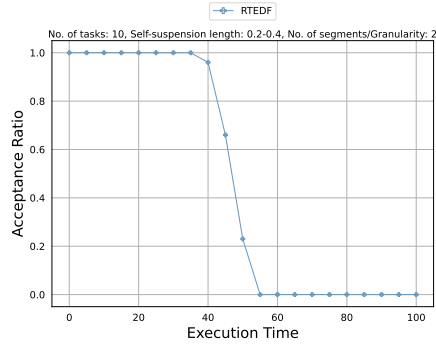


First UUniFast setup.

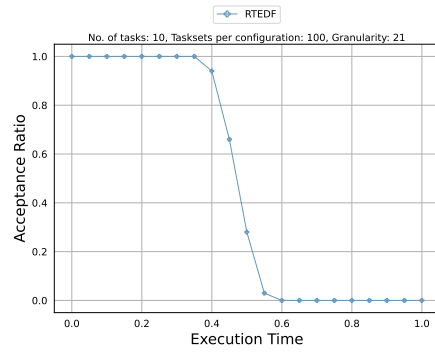
(DRS)



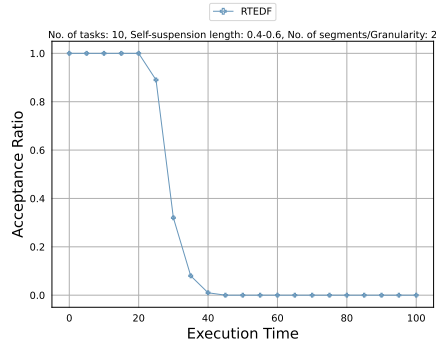
First DRS setup.



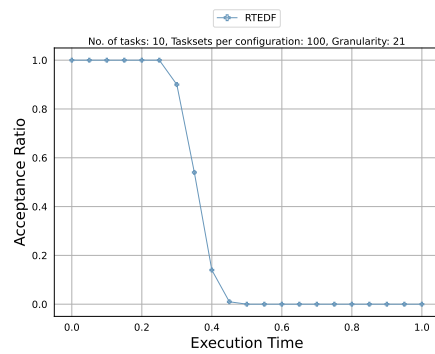
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.



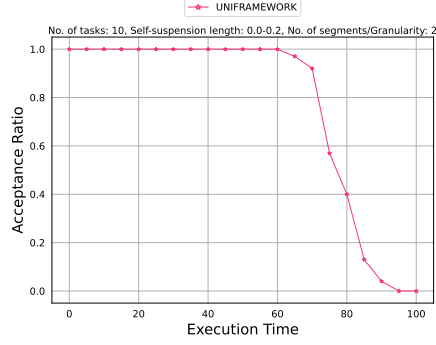
Third DRS setup.



## 7 UNIFRAMEWORK

We are going to generate a Uniframework schedule for the DRS and UUniFast setups explained above

(UUnifast)

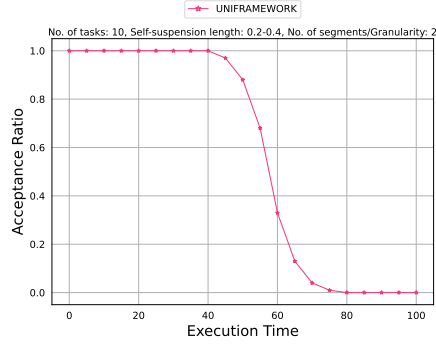


First UUnifast setup.

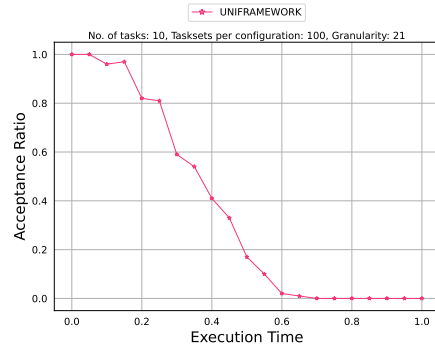
(DRS)



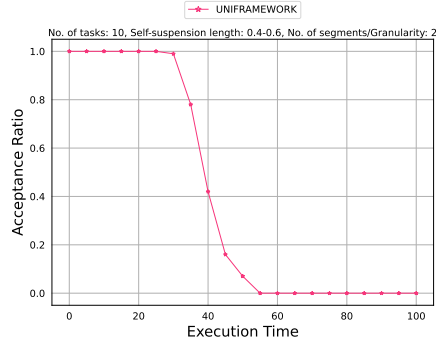
First DRS setup.



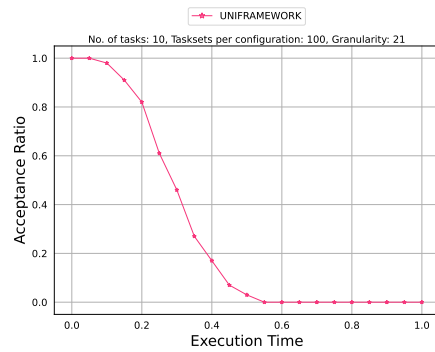
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

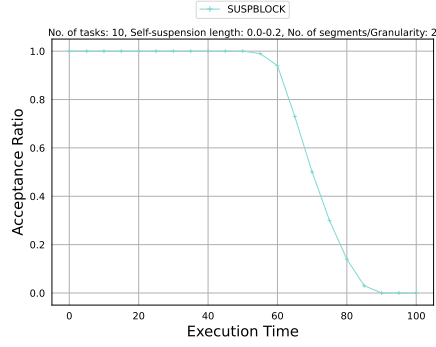


Third DRS setup.

## 8 Suspension Block

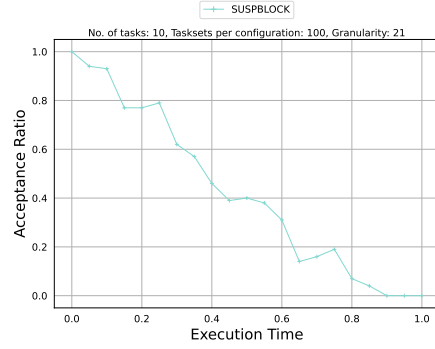
We are going to generate a Suspension Block schedule for the DRS and UUni-Fast setups explained above

(UUnifast)

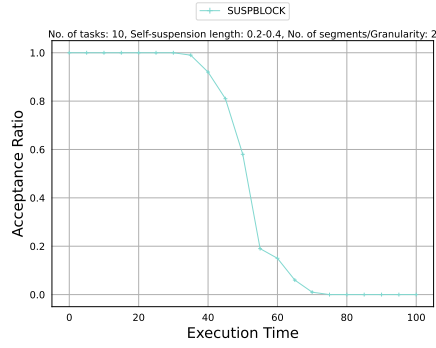


First UUnifast setup.

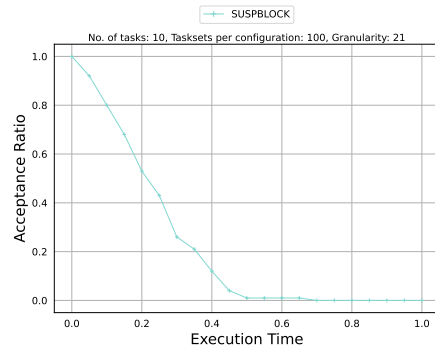
(DRS)



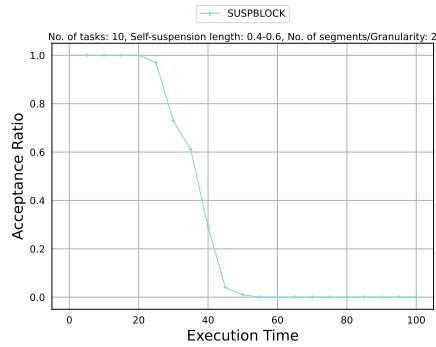
First DRS setup.



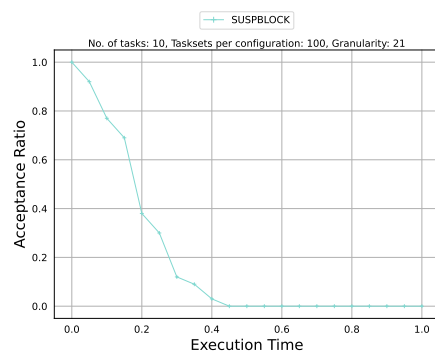
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

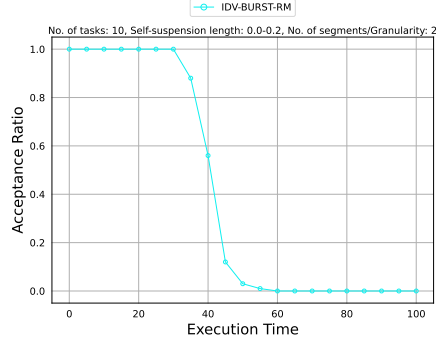


Third DRS setup.

## 9 Idv Burst RM

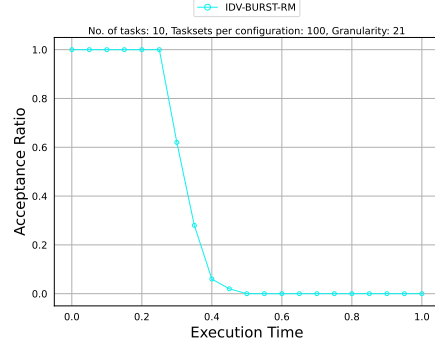
We are going to generate a Idv Burst RM schedule for the DRS and UUniFast setups explained above

(UUniFast)

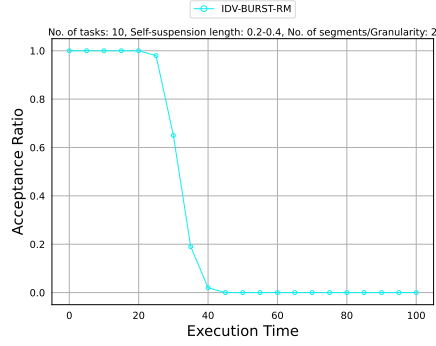


First UUniFast setup.

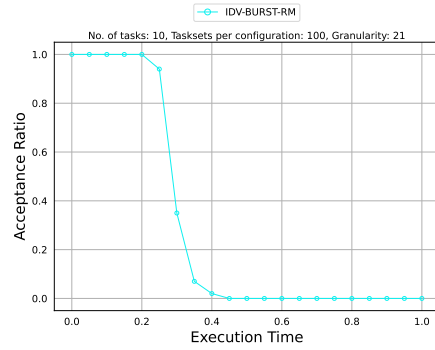
(DRS)



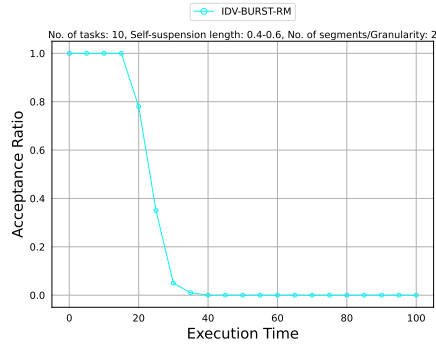
First DRS setup.



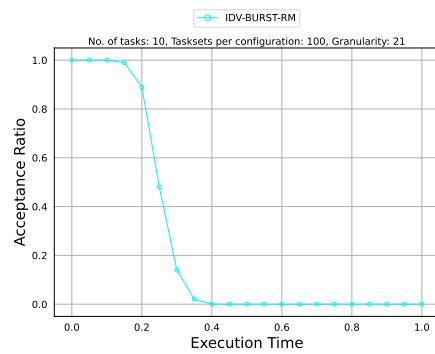
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

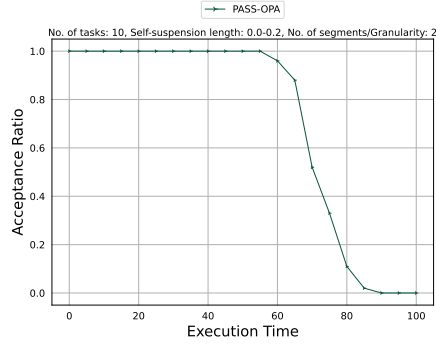


Third DRS setup.

## 10 PASS - OPA

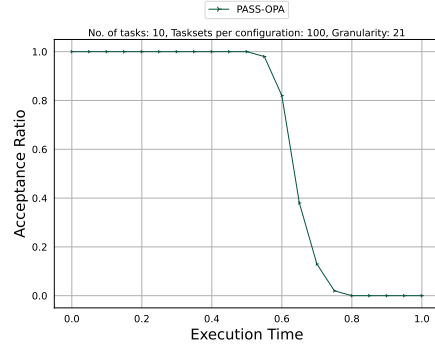
We are going to generate a PASS-OPA schedule for the DRS and UUniFast setups explained above

(UUniFast)

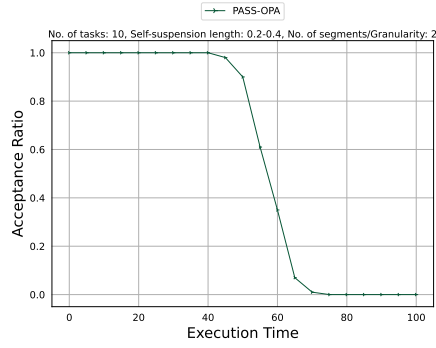


First UUniFast setup.

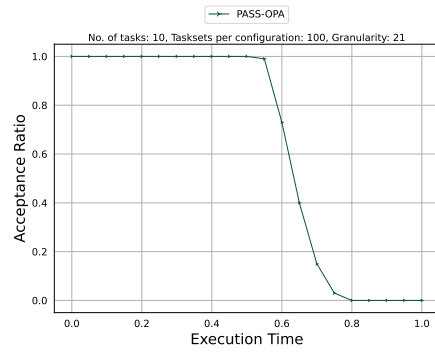
(DRS)



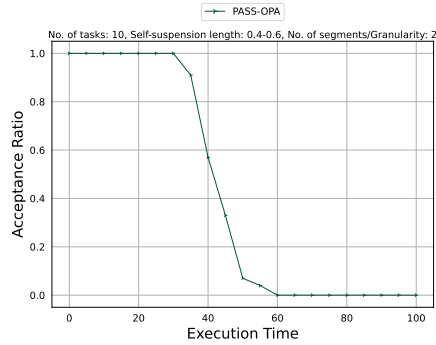
First DRS setup.



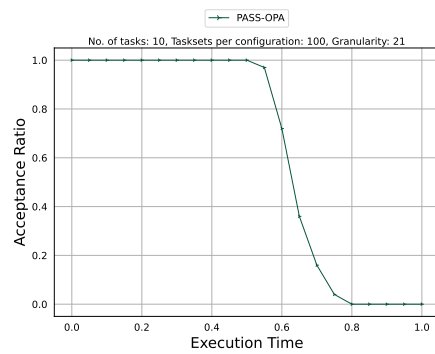
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

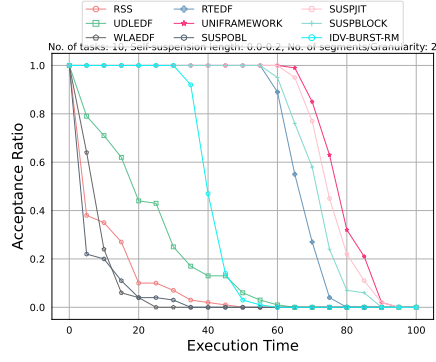


Third DRS setup.

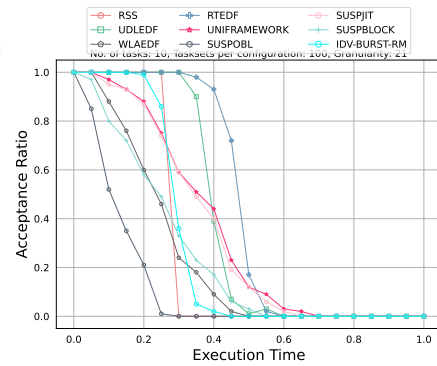
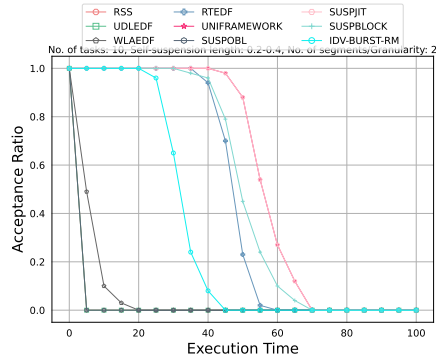
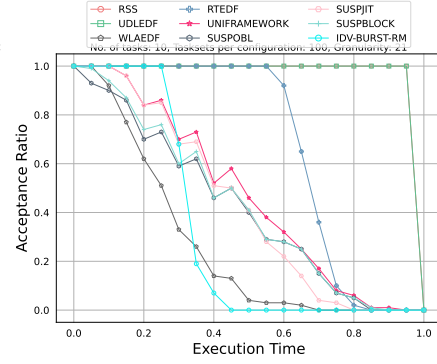
## 11 Comparing all Dynamic Algorithms at a glance

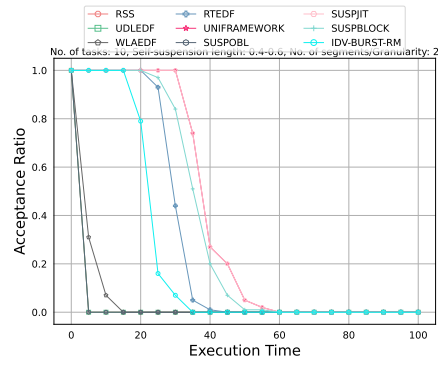
We are making a comparison chart for all the Dynamic Algorithms testing different task sets generated by DRS and UUnifast using each setup

(UUnifast)

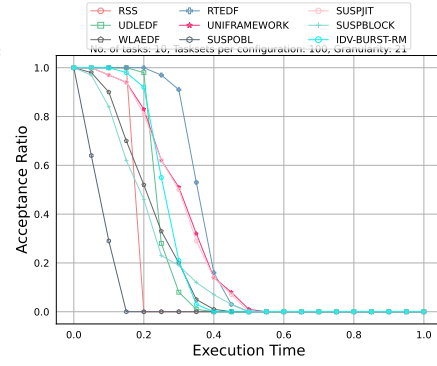


(DRS)





Third UUnifast setup.

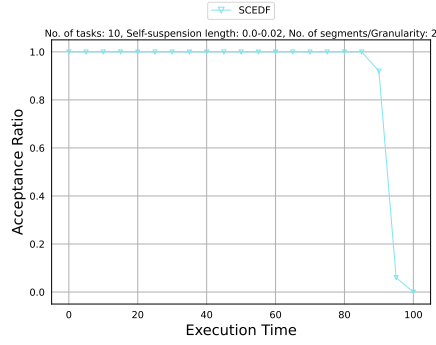


Third DRS setup.

## 12 SCEDF

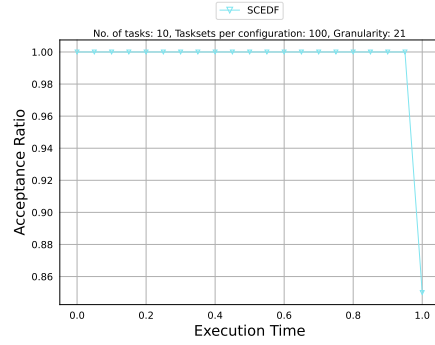
Generating a SCEDF schedule for the DRS and UUniFast setups

(UUniFast)

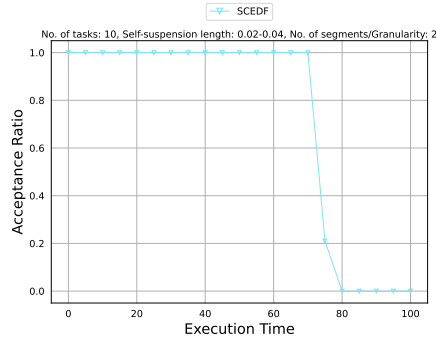


First UUniFast setup.

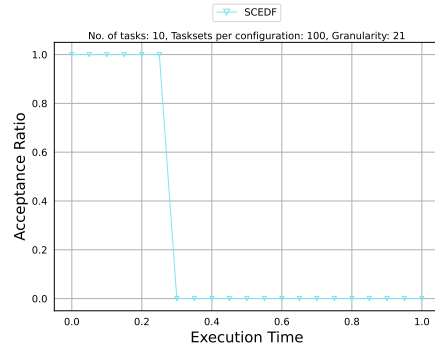
(DRS)



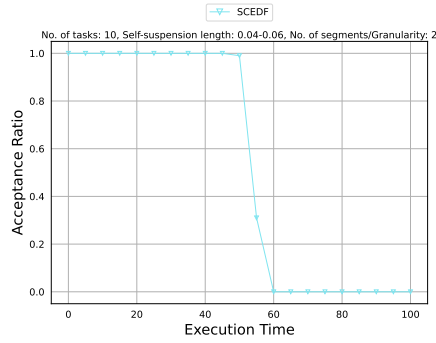
First DRS setup.



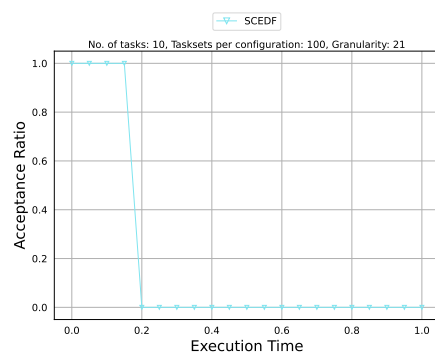
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

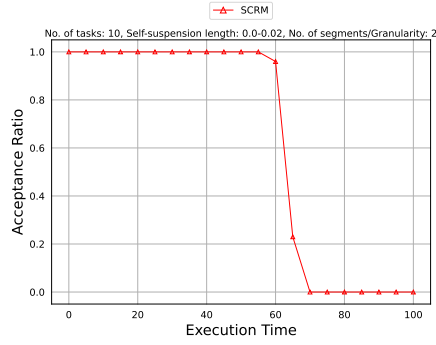


Third DRS setup.

## 13 SCRM

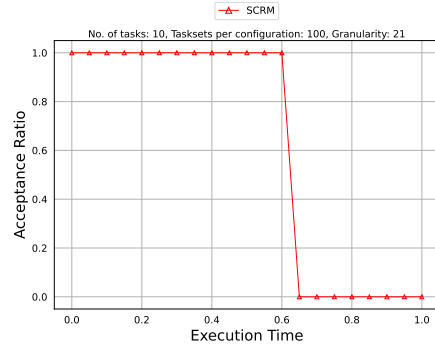
Generating a SCRM schedule for the DRS and UUniFast setups

(UUniFast)

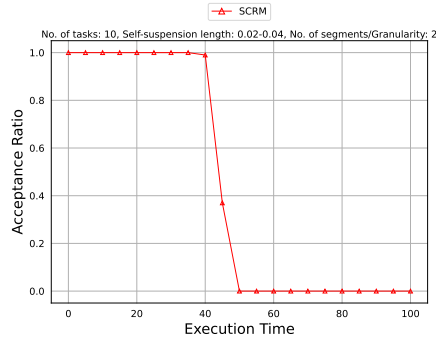


First UUniFast setup.

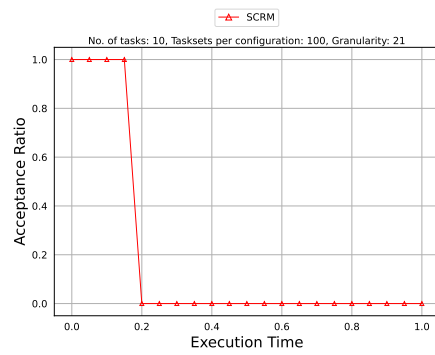
(DRS)



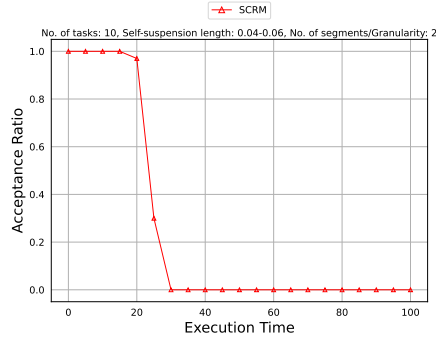
First DRS setup.



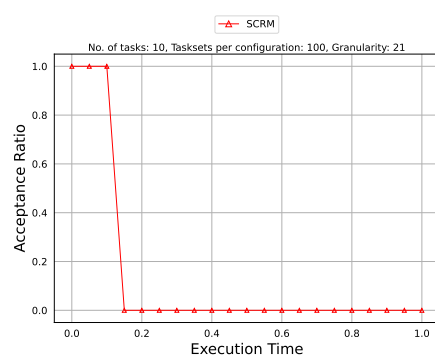
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.



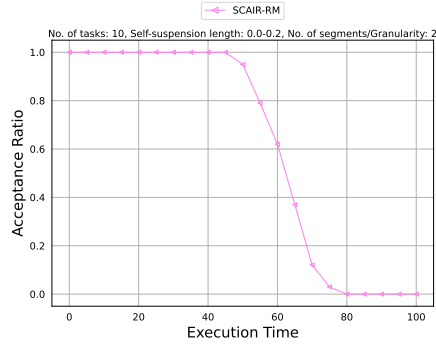
Third DRS setup.



## 14 SCAIR-RM

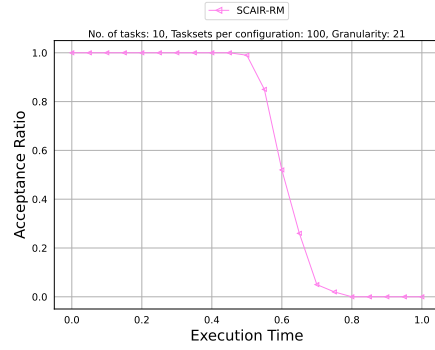
Generating a SCAIR-RM schedule for the DRS and UUniFast setups

(UUniFast)

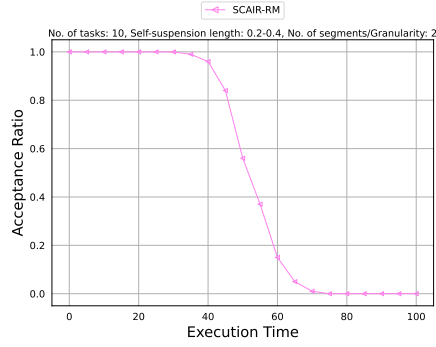


First UUniFast setup.

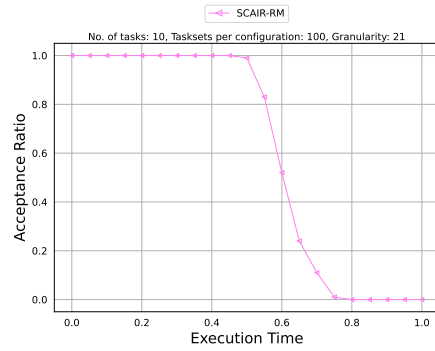
(DRS)



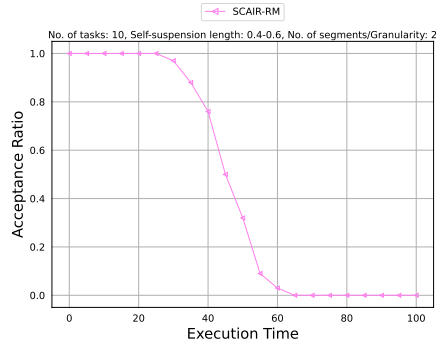
First DRS setup.



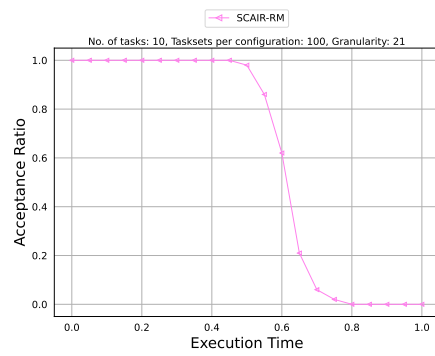
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

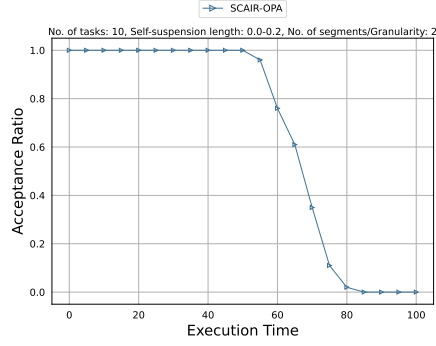


Third DRS setup.

## 15 SCAIR-OPA

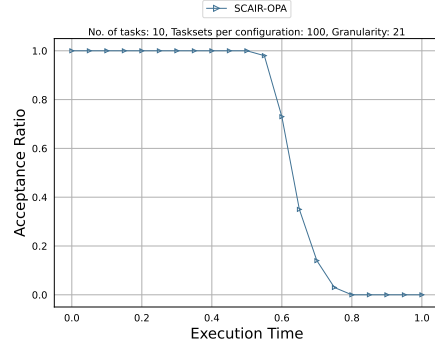
Generating a SCAIR-OPA schedule for the DRS and UUniFast setups

(UUniFast)

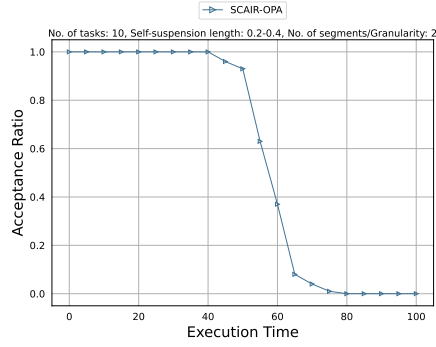


First UUniFast setup.

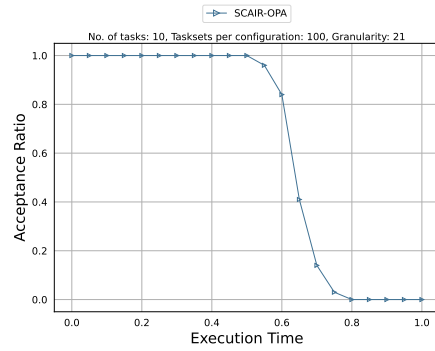
(DRS)



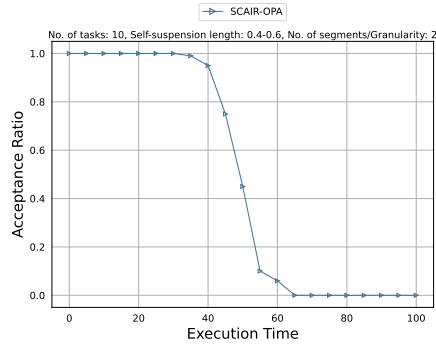
First DRS setup.



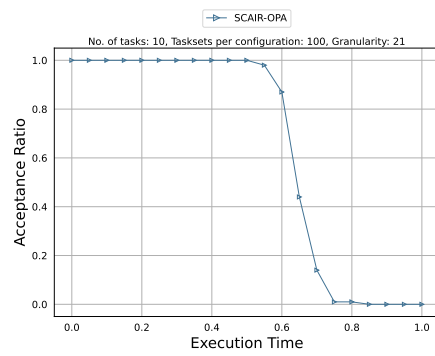
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

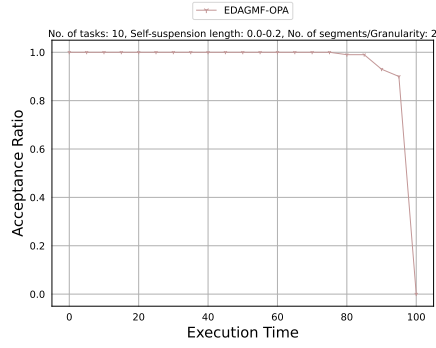


Third DRS setup.

## 16 EDAGMF-OPA

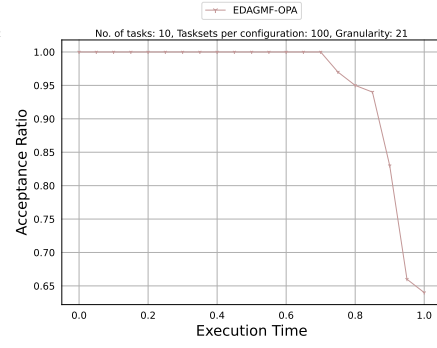
Generating a EDAGMF-OPA schedule for the DRS and UUniFast setups

(UUnifast)

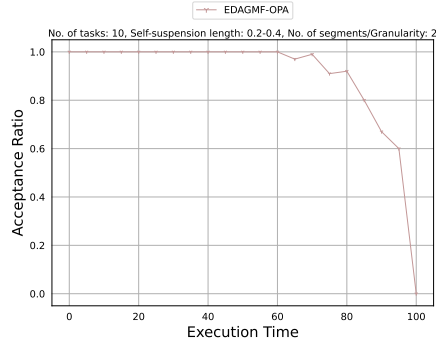


First UUnifast setup.

(DRS)



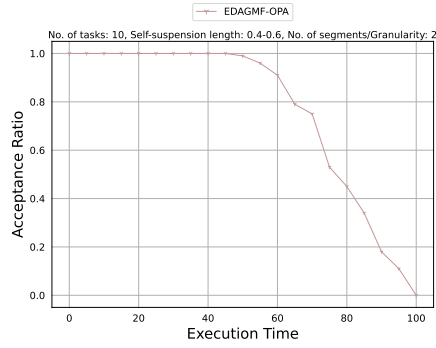
First DRS setup.



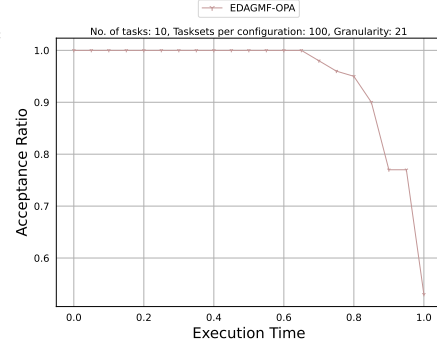
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.



Third DRS setup.

## 17 SRSR

Generating a SRSR schedule for the DRS and UUniFast setups

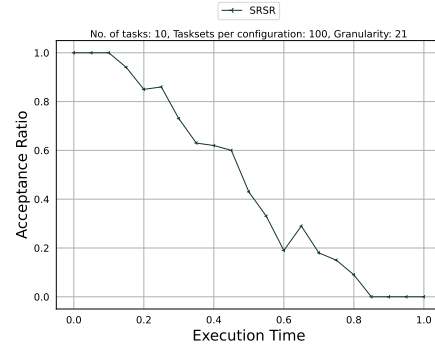
(UUniFast)

First UUniFast setup.

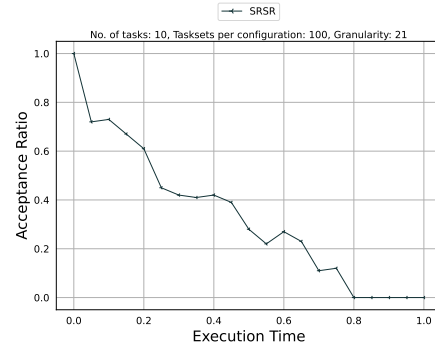
Second UUniFast setup.

Third UUniFast setup.

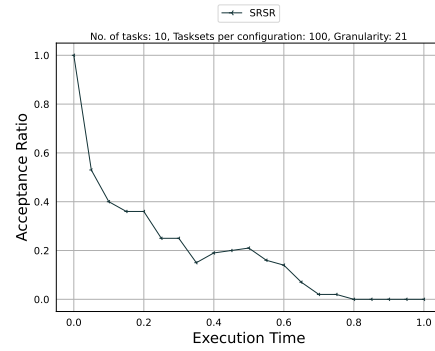
(DRS)



First DRS setup.



Second DRS setup.

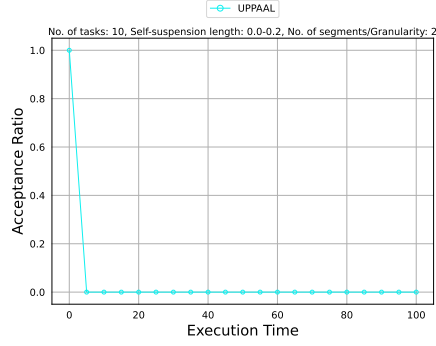


Third DRS setup.

## 18 UPPAAL

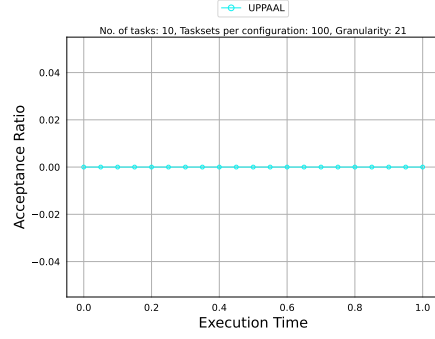
Generating a UPPAAL schedule for the DRS and UUniFast setups

(UUniFast)

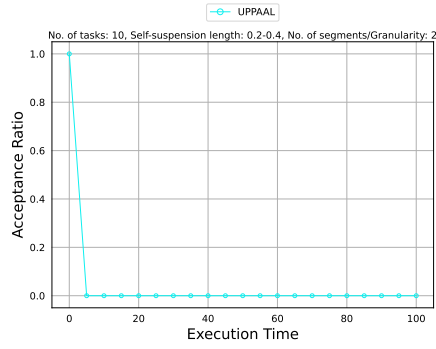


First UUniFast setup.

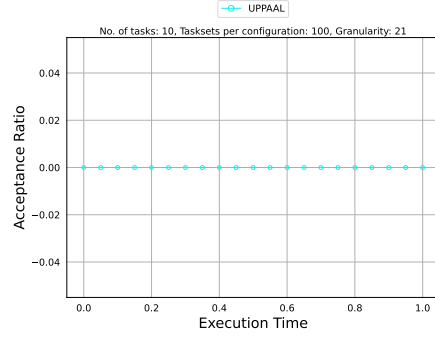
(DRS)



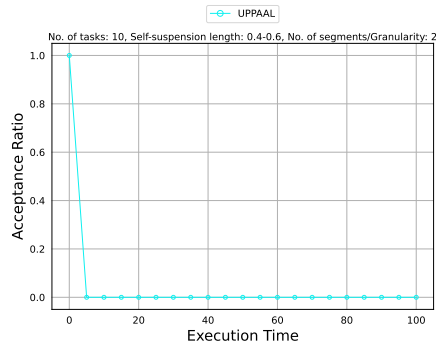
First DRS setup.



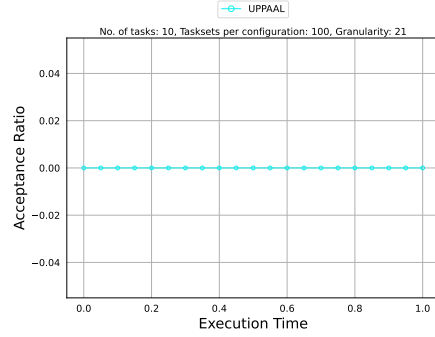
Second UUniFast setup.



Second DRS setup.



Third UUniFast setup.

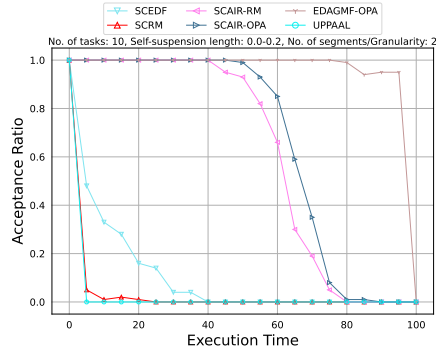


Third DRS setup.

## 19 Comparing all Segmented Algorithms at a glance

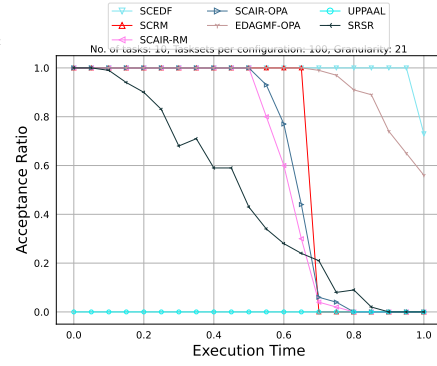
We are making a comparison chart for all the Segmented Algorithms testing different task sets generated by DRS and UUnifast using each setup

(UUnifast)

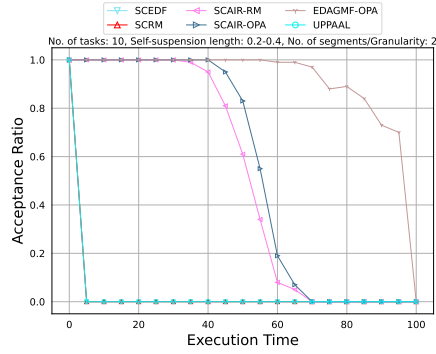


First UUnifast setup.

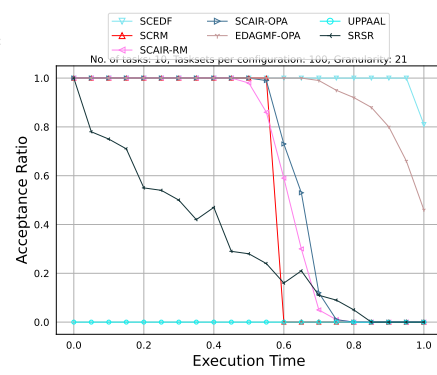
(DRS)



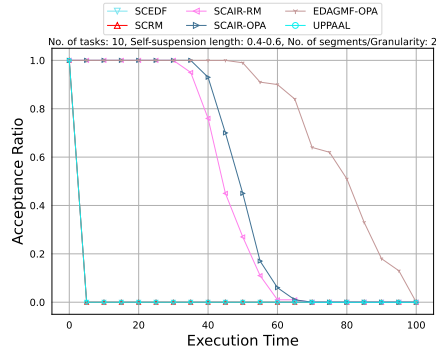
First DRS setup.



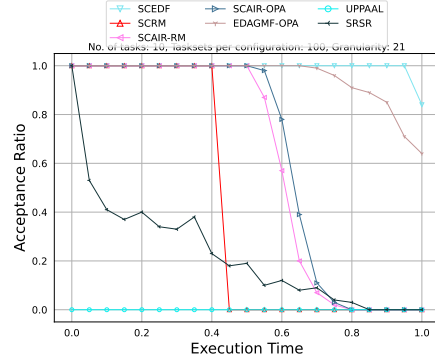
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.



Third DRS setup.

## Evaluation:

So, the parameter we use to compare is **Acceptance Ratio** with respect to the execution time i.e the percentage of tasksets that got accepted for a particular execution time. We are generating 100 task sets per configuration with 10 tasks per set with a suspension values ranging between 0,0 - 0,6.